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UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

FOR RELEASE ON DELIVERY
EXPECTED AT 10:00 A.M.
MAY 8, 1986

STATEMENT OF
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BEFORE THE
SUBCOMMITTEE ON ENERGY, NUCLEAR PROLIFERATION
AND GOVERNMENT PROCESSES
SENATE COMMITTEE ON GOVERNMENTAL AFFAIRS
ON
INTERNATIONAL RESPONSE
TO NUCLEAR POWER REACTOR SAFETY CONCERNS



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Mr. Chairman and Members of the Subcommittee:

I am pleased to be here today to discuss with you our work on international nuclear power reactor safety matters. In September 1985, we completed a review of the activities of the United States and international organizations to help prevent or mitigate the consequences of a nuclear power plant accident. (International Response to Nuclear Power Reactor Safety Concerns GAO/NSIAD-85-128).

Objectives of our review included (1) providing information on nuclear safety problems in other countries, (2) determining the status of international efforts to address these problems, (3) determining the extent to which information on nuclear accidents is being accumulated and shared internationally, and (4) examining efforts to establish a framework for an international response to a nuclear accident. Our comments today are based on the results of our review.

GROWTH OF NUCLEAR POWER CAPACITY AND SAFETY CONCERNS

As of September 1985 there was a worldwide total of 537 nuclear power plants operating, under construction, or on order; 408 of these were outside the United States. With the completion of nuclear plants already under construction or on order, 33 countries, including 17 developing countries will be operating

nuclear power reactors. The International Atomic Energy Agency (IAEA) projects that by the year 2000 slightly more than half of the countries with nuclear power plants will be developing countries. As the IAEA observed, many of these developing countries have little or no prior experience in operating nuclear power plants nor technical resources adequate for supporting effective, independent nuclear safety programs.

The growth in the use of nuclear power internationally over the past 25 years has heightened concern as to the need to ensure the health and safety of the general public as well as persons directly working with the technology. As we reported in September, the greatest danger from a nuclear accident is the release of significant amounts of radioactive material into the environment. While the IAEA views the overall nuclear safety record over the years as generally good, the accident at Three Mile Island focused worldwide attention on the question of nuclear safety. And, last week's accident at Chernobyl, which had much more serious consequences than the accident at Three Mile Island, underscores the need for increased international cooperation to cope with nuclear power safety problems. The statement this week by the heads of government at the Tokyo economic summit explicitly recognizes this need.

INTERNATIONAL EFFORTS TO ADDRESS SAFETY ISSUES

According to IAEA and U.S. government officials, the responsibility for nuclear safety rests with the individual countries that operate nuclear power plants. However, to help

these countries with their responsibilities, IAEA, the Nuclear Energy Agency (NEA) of the OECD, and the U.S. Nuclear Regulatory Commission (NRC) have undertaken programs designed to strengthen the safety of nuclear power systems.

Through the IAEA and/or the Nuclear Energy Agency, efforts have been initiated to develop safety standards or guidelines, exchange information, conduct research, and provide training and expert assistance to help improve nuclear safety. The Nuclear Regulatory Commission also has negotiated bilateral nuclear safety arrangements with 21 countries.

NUCLEAR REACTOR INCIDENTS IN FOREIGN COUNTRIES

The Nuclear Regulatory Commission collects information on safety-related operating incidents at foreign nuclear power plants from a number of sources; however, it informed us that it relies primarily on the NEA and IAEA incident reporting systems and on information shared under bilateral nuclear safety agreements. Our review of NRC information shows that from 1971 to August 1984, there were data on 2 significant and 149 potentially significant incidents at foreign nuclear power reactors, not including the Soviet bloc for which there was no information. According to the NRC, a significant incident would include (1) significant release of or exposure to radioactive material, (2) significant degradation of safety-related systems, (3) significant deficiencies in design, construction, operation, or safety evaluation, (4) significant generic problems, and (5) significant consequential actions. A potentially significant

incident refers to an event which had no significant effects on a plant or the public but requires further engineering analysis to determine if it has safety implications for U.S. reactors. Attachment I lists the reactor systems in which these incidents occurred. Until earlier this week, when NRC authorized its release, this information was not available to the public.

SHARING SAFETY INFORMATION

Countries operating nuclear power plants have become increasingly aware of the value of sharing operating safety data and experience to help prevent accidents. If reactor operators are aware of incidents that have occurred elsewhere, abnormal events may be avoided or their severity mitigated.

As of June 1984, operators in about 300 nuclear power plants worldwide had accumulated over 3,100 years of reactor experience. According to IAEA, this experience is valuable for recognizing the causes of accidents and the methods of avoiding or dealing with them. The extent to which nuclear accidents might be avoided or their effects mitigated through the international sharing of reactor experience probably cannot be measured. However, the potential value of such data sharing is widely accepted. After the Three Mile Island accident, U.S. officials learned that similar incidents had occurred at nuclear power plants in Switzerland (in 1974) and Ohio (1977), but the operational experience gained from them was not readily available for use at Three Mile Island. In both cases the problems were solved before serious damage was done. Information on the Ohio

experience was provided to the NRC but was not known to the operators of Three Mile Island.

The United States participates in bilateral and NEA incident reporting efforts, but at the time of the completion of our audit work, it was reluctant to agree to participate directly in the IAEA system because of perceived problems of duplication with the NEA system and the lack of meaningful participation by the Soviet Union. While there may be some duplication in the sharing of information, the IAEA system includes a large number of countries that are not in the NEA system. The United States has since agreed to join and participate in the IAEA system. We believe that, in view of the serious accident at Chernobyl, full participation by all nations that have nuclear power programs would maximize the benefits of the incident reporting arrangements. Sharing such information, if the United States can acquire more information on Soviet reactors, is of special importance in view of the Soviet construction of two large nuclear power reactors in Cuba.

ESTABLISHING A FRAMEWORK FOR AN INTERNATIONAL RESPONSE TO NUCLEAR ACCIDENTS

During our review, we found that problems resulting from a serious nuclear accident may be beyond the response capability of many countries and may require assistance from other countries. The kinds and level of resources required to respond to a major accident was dramatically demonstrated at Three Mile Island. Substantial technical support and major commitments of resources were required on short notice to deal with the operational

problems at the crippled reactor, to implement the plan for reactor cooldown, to manage the radioactive waste problem, etc. The number of on-site technical support people grew from 10 to almost 2,000 within two weeks. The complexity of the problem is further revealed by last week's accident at Chernobyl.

According to the IAEA, many countries would not have sufficient technical personnel to handle such an accident. In case of a similar accident abroad, the U.S. government has identified the type of technical assistance that national governments might request from the United States. There are, however, a number of obstacles which the State Department believes could impede the timely and effective provision of external assistance. They include (1) the issue of liability, (2) the legal status of the assisting party, (3) the question of who controls and directs assisting personnel, and (4) the question of who bears the costs incurred by the assisting party. These problems should best be resolved in advance and the State Department has indicated that it is possible to do so, thereby overcoming these impediments to providing assistance. In 1981, the United States initiated action to negotiate an international convention setting forth the legal terms and arrangements that would apply to the provision of emergency assistance by one country to another in the event of a major nuclear accident. Some European nations expressed concern as to whether such a convention was needed. Some countries have been concerned about the issue of contingent liabilities, and some about the length of

time and effort it would take to negotiate and ratify such a convention. Instead, in an IAEA experts' panel, agreement was reached that a reference document be prepared with a single set of provisions setting forth the terms and conditions that could be applied to emergency assistance. The panel believed this document could serve as a model for negotiating bilateral or regional agreements and as a basis for agreement between a requesting and an assisting nation at the time of a nuclear emergency. In January 1984, the IAEA published a set of Guidelines for Mutual Assistance Arrangements in Connection with a Nuclear Accident. The guidelines apply to a situation where one country asks for help from another country or countries. No country is required to request, accept, offer, or provide assistance merely by reason of acceptance or use of the guidelines. In other words, the guidelines are informational and not binding on any country. As a result, there is still a gap. Despite past foreign opposition to an international convention on emergency assistance, other countries may be re-evaluating their positions in light of the Chernobyl accident. Consequently, the subject might usefully be raised again by the United States.

Mr. Chairman, this concludes my statement. I would be happy to try to respond to any questions you may have.

ATTACHMENT I

SYSTEMS IN NUCLEAR POWER REACTORS IN OTHER
COUNTRIES WITH SIGNIFICANT OR POTENTIALLY
SIGNIFICANT SAFETY INCIDENTS SINCE 1971

	<u>Number of Occurrences</u>
Main steam supply systems	22
Coolant recirculation systems and support	22
Reactivity control systems	17 (a)
On and/or off-site power systems	14
Emergency core cooling systems	13 (a)
Residual heat removal systems	11
Condenser and feedwater systems	10
Reactor vessel integrity and operability	8
Emergency generator systems	7
Reactor core systems	5
Containment systems and control	5
Spent fuel and waste management systems	7
Turbine generator systems	4
Fuel handling systems	2
Other	<u>4</u>
 Total	 <u>151</u>

(a) Includes one "significant" safety incident.

Source: Compiled from NRC's Foreign Event File.